

Results of Diagnostics Competition

Budget Planning Meeting,
March 12 – 13, 2002

Darlene Markevich

Diagnostics Competition

- Thanks to:
 - PIs who submitted proposals
 - Reviewers
 - Panel Members

Diagnostics Competition Process

- Entire diagnostics program was competed
- New players were invited to submit proposals
- Do not plan to re-compete at the end of this ~3-year cycle

Diagnostics Competition Process

- Proposals submitted
 - 32 from universities/industries (1 non-U.S.)
 - 7 from labs
- Each proposal mailed to 3 people for review
- Reviewers' comments sent to PIs for rebuttal
- Panel convened

Diagnostics Competition

Panel Process

- Each panel member had the lead on one or more proposals
 - Provided a synopsis of proposal, reviewer comments, and PI rebuttal for other panel members
 - Reconciled score from the mail review with the words and noted anomalies
 - Each proposal discussed in detail

Results of Diagnostics Competition

Panel Process

- Panel members provided **individual rankings** of the proposals
 - Lab proposals were ranked 1-7
 - University/industry proposals were ranked 1-30
- Panel members with a **conflict** of interest on a proposal **did not rank** that proposal

Diagnostics Competition

Results

- Funded at the **historical ratio** (pre-set)
 - 11 grants (85% \$)
 - 4 lab programs (15% \$)
- **Funding** is being provided for **orderly closeout** of programs not being renewed

Diagnostics Competition

Results

- Process resulted in institutional **impacts**
 - Lost 4 universities
 - Lost 2 labs (1 did not submit)
 - Gained 1 new lab
- **Distribution** of diagnostic efforts
 - 9 programs on D3D, C-Mod, or NSTX
 - 4 programs on innovative confinement concepts
 - 4 programs on tokamaks in Europe

Diagnostics Competition

Results

- 1 **UNIVERSITY OF CALIFORNIA, DAVIS** Neville Luhmann
Innovative Diagnostic Developments for Turbulence and Transport Measurement and Visualization
Renewal: 2-D ECE imaging for T_e and $T_{e\sim}$, 2-D microwave imaging reflectometry for $n_{e\sim}$; ITG modes, transport, core imaging
TEXTOR
- 2 **PRINCETON PLASMA PHYSICS LABORATORY** Ernesto Mazzucato
Innovative Diagnostic Developments for Turbulence and Transport Measurement and Visualization
Renewal: Collaborative effort with above UC Davis proposal
- 3 **UNIVERSITY OF CALIFORNIA, LOS ANGELES** Dave Brower
Development of Advanced Magnetic and Density Diagnostics for Fusion Science
Renewal: High-resolution (amp. & time) polarimetry/interferometry for internal B field structure, B_{\sim} , n_e , and $n_{e\sim}$; RFP transport
MST, HSX
- 4 **UNIVERSITY OF CALIFORNIA, LOS ANGELES** Tony Peebles
A Unique Measurement System to Investigate the Existence and Role of Predicted Turbulent Modes in Electron and Ion Transport
Renewal, New Direction: Collective high-k FIR scattering for $n_{e\sim}$, spatially localized; ETG. Reflectometry for low-k $n_{e\sim}$ and FIR polarimetry for B_{\sim} ; ITG, tearing modes. Dual mode reflectometry for local B mod; q profile, stability in ST. Mode conversion scatt. for B_{\sim} @ hi-k; ETG
DIII-D, ET
- 5 **GENERAL ATOMICS** Ray Fisher
Alpha Particle Diagnostics and Physics Studies
Renewal: Bubble neutron detectors for DT neutron tails due to alpha collisions; spatial and energy distribution of confined DT alphas in hot plasma core
JET

Diagnostics Competition Results

- 6 **JOHNS HOPKINS UNIVERSITY** Warren Moos; Mike Finkenthal
USXR to XUV Diagnostics for Edge and Core Tokamak and Alternative Concept MCF Plasmas
Renewal, Some New Directions: Fast, large-pixel imaging USXR-XUV spectroscopy for line and continuum emission; particle transport, MHD, turbulence, Zeff, and local power loss.
NSTX
- 7 **LAWRENCE LIVERMORE NATIONAL LABORATORY** Mark May; Peter Beiersdorfer
Toroidal Rotation Measurements for Tokamaks with Fast Time Resolution
New: Visible spectroscopy for highly charged ions; plasma toroidal rotations (200 usec to 1 msec), L-H mode transitions
C-Mod
- 8 **UNIVERSITY OF MARYLAND** Hans Griem
Measurement of Radiative Transfer in Vacuum-UV Emission from Magnetic Fusion Devices
Renewal, New Direction: High-resolution transmission grating VUV spectrometer for deuterium Ly alpha transitions, particle transport and turbulence
MCX, C-Mod
- 9 **MASSACHUSETTS INSTITUTE OF TECHNOLOGY** Miklos Porkolab
Phase Contrast Imaging Diagnostic
Renewal: Phase contrast imaging (interferometry) for ne~: high-k ETG modes, low-k ITG
DIII-D, C-Mod
- 10 **MASSACHUSETTS INSTITUTE OF TECHNOLOGY** Paul Woskov
High Power Collective Thomson Scattering Diagnostics on Energetic Ions
Renewal: High power CTS for MeV-ion energy distribution, localization, and direction: TAE modes, sawteeth, ITBs
TEXTOR, ASDEX

Diagnostics Competition Results

- 11 **NOVA PHOTONICS, INC.** Fred Levinton
Development of the Motional Stark Effect Diagnostic Using Laser-Induced Fluorescence
Renewal: Motional stark effect using laser-induced fluorescence for B field and B field pitch angle; current density & pressure profiles
NSTX
- 12 **PRINCETON PLASMA PHYSICS LABORATORY** Manfred Bitter
X-ray Imaging Crystal Spectrometer for Magnetic Fusion Energy Research
New: X-ray imaging spherically bent quartz crystal spectrometer for trace impurities; Ti Te profiles, impurity ion charge state distribution
NSTX
- 13 **PRINCETON PLASMA PHYSICS LABORATORY** Phil Efthimion
Completion of a New ECE Diagnostic for Measurement of Temperature Based Upon the Electron Bernstein Wave
Renewal: Microwave radiometer for EBW emission; Te, EBW current drive and heating
CDX-U,NSTX
- 14 **RENSSELAER POLYTECHNIC INSTITUTE** Paul Schoch; Diane Demers
Mapping the Magnetic Field Structure of a Plasma via Spectroscopic Ion Beam Imaging
Renewal, New Direction: Spectral imaging of a heavy ion beam for time resolved internal B field profile; RFP current profile equilibrium reconstruction
MST
- 15 **UNIVERSITY OF WISCONSIN** Ray Fonck
Diagnosis of Multifield, Multidimensional, Nonlinear Turbulence Properties in Advanced Tokamak Plasmas
Renewal: 2D BES for n_{\sim} , $v_{r\sim}$, $v_{\theta\sim}$ from density field analysis; nonlinear mode coupling, E transfer, & growth rates, and zonal flow. High-freq CHERS for $T_{i\sim}$, $v_{\phi\sim}$; core turbulent particle and heat fluxes
DIII-D